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**REMEDIAL ACTION PLAN ACTIVITIES REPORT  
LAKE METALS/PIONEER REFINING  
SALT LAKE CITY, UTAH**

Project No. 1076-41F

To

Utah Department of Environmental Quality  
Division of Environmental Response and Remediation  
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SCANNED

DERR - 2007-000624

Prepared By:

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April 10, 2007



**WASATCH**  
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April 10, 2007  
Project No.: 1076-41F

SUBJECT: Remedial Action Plan Activities Report  
Lake Metals/Pioneer Refining  
Salt Lake City, Utah


Wasatch has prepared this Remedial Action Plan Activities Report subsequent to conducting activities outlined in Wasatch's April 10, 2006, "Remedial Action Plan" at the Lake Metals/Pioneer Refining site which has been accepted into the Utah State Voluntary Cleanup Program (VCP).


Based on the information presented in this report, Wasatch is requesting a Certificate of Completion for the VCP applicants.

Should you have any questions, please do not hesitate to contact us.

Sincerely,

WASATCH ENVIRONMENTAL, INC.

  
Rebecca Studenka  
Geologist

  
Julie Kilgore, Principal  
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## TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
1. INTRODUCTION .....	1
2. SOIL EXCAVATION ACTIVITIES.....	1
3. FIELD QUALITY CONTROL PROCEDURES .....	2
4. SOIL EXCAVATION ANALYTICAL RESULTS.....	2
4.1 Total Lead and Arsenic.....	2
4.2 TPH-DRO and TRPH .....	3
4.3 Volatile Organic Compounds.....	3
4.4 Polychlorinated Biphenyls .....	3
4.5 TPH Fractionation.....	3
5. DERR CONFIRMATION SAMPLING ACTIVITIES .....	4
6. DERR SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS .....	4
7. ADDITIONAL SOIL EXCAVATION ACTIVITIES .....	4
8. DERR AND WASATCH SOIL CONFIRMATION SAMPLE RESULTS.....	4
9. CONCLUSIONS AND RECOMMENDATIONS .....	5
REFERENCES .....	6

**TABLES**

Table 1 – Lead and Arsenic Soil Analytical Results

Table 2 – TPH-DRO and TRPH Concentrations in Soil

Table 3 – Organic Concentrations in Soil

Table 4 – PCB Concentrations in Soil

Table 5 – TPH Fractionation Analyses in Soil

Table 6 – Confirmation Sampling Conducted by Utah DERR and Wasatch Lead and Arsenic Soil Results

**FIGURES**

Figure 1 – Excavation Area and Confirmation Sample Locations

**APPENDICES**

Appendix A – Lead and Arsenic Analytical Results

Appendix B – TPH-DRO and TRPH Analytical Results

Appendix C – VOC Analytical Results

Appendix D – PCB Analytical Results

Appendix E – TPH Fractionation Analytical Results

Appendix F – DERR/Wasatch Lead and Arsenic Analytical Results

Appendix G – Waste Manifests

Appendix H – Data Validation Report

**REMEDIAL ACTION PLAN ACTIVITIES REPORT  
LAKE METALS/PIONEER REFINING  
SALT LAKE CITY, UTAH**

## **1. INTRODUCTION**

Wasatch has prepared this Remedial Action Plan (RAP) Activities report to discuss the completed remedial action activities conducted at the Lake Metals/Pioneer Refining site, which has been accepted into the Utah State Voluntary Cleanup Program (VCP). The RAP activities were conducted in accordance with the approved April 10, 2006, "Remedial Action Plan" submitted by Wasatch to Utah Division of Environmental Response and Remediation (DERR).

As discussed in the RAP, the purpose of the remedial action activities was to remove surficial soils at the site with concentrations of lead and arsenic above determined generic screening criteria for the Lake Metals/Pioneer Refining site. Soil confirmation samples were collected and analyzed to verify the remaining lead and arsenic concentrations at the site were below the generic screening criteria of 800 mg/kg and 100 mg/kg, respectively.

## **2. SOIL EXCAVATION ACTIVITIES**

Between July 31, 2006 and August 16, 2006, Wasatch supervised the removal of surficial soils at the Lake Metals/Pioneer Refining site. The unpaved areas of the site were excavated to approximately six inches below ground surface using a backhoe. Nine confirmatory soil samples (BS-1, 6" to BS-9, 6") were collected at various locations from the base of the excavation. The soil samples were collected in the appropriate containers with gloved hands and transported on ice to a Utah-certified laboratory for lead and arsenic analysis using U. S. EPA Method 6010B. The excavated area and confirmatory soil sample locations are presented on Figure 1.

As discussed in the RAP, at the location of previous soil samples LM-SS-03 and LM-SB-03, an area 10 feet by 10 feet (100 square feet) was removed to a depth of approximately two feet below ground surface. Five composite soil samples were collected from the area. One soil sample (#1 BS-2') was collected in ten aliquots from the bottom of the excavation, each aliquot representing 10 square feet of the excavation. The other four samples (#1 SW-W, #1 SW-S, #1 SW-E, and #1 SW-N) were collected in ten aliquots each, each sample taken from one sidewall of the excavation. The soil samples were collected in the appropriate containers with gloved hands and transported on ice to a Utah-certified laboratory for lead and arsenic analysis using U. S. EPA Method 6010B. The excavated area and confirmatory soil sample locations are presented on Figure 1. It should be noted that these sample locations are representations and are not actual locations as numerous aliquots for sample collection were used from the base and sidewalls of this excavated area.

Additionally, at the location of previous soil samples LM-SS-12 and LM-SB-12, an area 10 feet by 10 feet (100 square feet) was removed to a depth of approximately two feet below ground surface. During removal activities of this area, a small old abandoned pipe was discovered in the subsurface which contained a black, odorous substance. The origin of the pipe was unknown. Five composite soil samples were collected from the area. One soil sample (#2 BS-1,2') was collected in ten aliquots from the bottom of the excavation, each aliquot representing 10 square feet of the excavation. The other four samples (#2, SW-W, #2 SW-S, #2 SW-E, and #2 SW-N) were collected in ten aliquots each, each sample taken from one sidewall of the excavation. The soil samples were collected in the appropriate containers with gloved hands and transported on ice to a Utah-certified laboratory for lead and arsenic analysis using U. S. EPA Method 6010B. In addition, based on the discovery of the pipe and its unknown contents, the soil samples were analyzed for volatile organic compounds (VOCs), total petroleum hydrocarbons-diesel range organics (TPH-DRO), total recoverable petroleum hydrocarbons (TRPH) and polychlorinated biphenyls (PCBs) using U.S. EPA Methods 8260B, 8015B, 1664-SGT, and 3545/8082, respectively. The

excavated area and confirmatory soil sample locations are presented on Figure 1. It should be noted that these sample locations are representations and are not actual locations as numerous aliquots for sample collection were used from the base and sidewalls of this excavated area.

On August 7-9, 2006, Wasatch personnel supervised the removal of broken concrete located in the central portion of the site. During removal activities, black stained soil was discovered beneath the concrete. The source of the staining was unknown. Based on the staining, the excavation in this area was extended to approximately 1.5 feet below ground level. Two confirmatory soil samples (BS-10, 1.5' and BS-11, 1.5') were collected from the base of the excavated area formerly beneath the area of broken concrete. Additionally, a small underground concrete vault was discovered in the northern portion of this area. Reportedly, a bailer formerly in use at the site, was previously located in this area. Soil was removed from the vault until maximum extension of the backhoe was reached at a depth of approximately 12 feet below ground surface. A confirmatory soil sample (#3 Base, 12') was collected in the base of the concrete vault. The soil samples were collected in the appropriate containers with gloved hands and transported on ice to a Utah-certified laboratory for lead and arsenic analysis using U. S. EPA Method 6010B. Additionally, based on visual staining, the soil samples were analyzed for VOCs, TPH-DRO, TRPH, and PBCs using U.S. EPA Methods 8260B, 8015B, 1664-SGT, and 3545/8082, respectively. Both excavated areas and their associated confirmatory soil sample locations are presented on Figure 1.

In order to control fugitive dust during soil removal activities, water was sprayed on the ground in the areas under active excavation. Approximately 533 cubic yards of non-hazardous surficial soils were removed from the site and transported to Clean Harbors Grassy Mountain facility near Clive, Utah. Additionally, based on previous lead concentration analytical results, approximately 50 cubic yards of soil removed from the two excavated areas in the locations of former soil samples LM-SS-03/LM-SB-03 and LM-SS-12/LM-SB-12 was removed from the site and transported to Clean Harbors Grassy Mountain facility near Clive, Utah as hazardous waste. The non-hazardous and hazardous waste manifests are presented in Appendix G.

Once the excavation was deemed completed, approximately 718 tons of clean road base were transported to the site from Staker Parsons Companies in North Salt Lake, Utah. The road base was spread and compacted over the excavated areas. In September 2006, A-Rock Asphalt Services asphalted the excavated areas.

### 3. FIELD QUALITY CONTROL PROCEDURES

As discussed in the April 2006 RAP, Quality Assurance/Quality Control (QA/QC) soil samples were collected in addition to the field samples. Two field duplicate samples (BS-3 dup and BS-5 dup) and two method spike/method spike duplicate samples (BS-2 and BS-4) were collected and analyzed. Decontamination samples were not collected as re-usable sampling equipment was not used between soil sample locations. In addition, all field activities were conducted in accordance with applicable EPA guidance and Wasatch's August 18, 2005, "Quality Assurance Project Plan."

### 4. SOIL EXCAVATION ANALYTICAL RESULTS

Tables summarizing the soil analytical results are presented as Table 1 through Table 6. The soil analytical results are presented in Appendix A through Appendix F. The Data Validation Report completed by an independent third party is presented as Appendix H.

#### 4.1 Total Lead and Arsenic

As specified in the April 2006 RAP, the goal of the RAP activities was to remove surficial soils from the site with concentrations of lead and arsenic in exceedance of 800 mg/kg and 100 mg/kg, respectively. Upon removal of the surficial soils at the site, Wasatch personnel collected 13 base and 8 sidewall confirmation soil samples in the soil excavation area. The analytical results indicated that none of the

confirmation soil samples collected had reported concentrations of lead or arsenic above the determined generic screening criteria. A table summarizing the reported lead and arsenic concentrations is presented as Table 1. The lead and arsenic analytical results are presented in Appendix A.

#### 4.2 TPH-DRO and TRPH

Based on apparent soil staining during excavation activities, four base and four sidewall soil samples collected during excavation activities were analyzed for total petroleum hydrocarbons-diesel range organics (TPH-DRO) and total recoverable petroleum hydrocarbons (TRPH). The analytical results indicated that the soil sample collected from the base of the concrete vault (#3 Base, 12') had a reported concentration of TPH-DRO at 800 mg/kg, in exceedance of the current Utah Initial Screening Level (ISL) of 500 mg/kg. All other reported TPH-DRO and TRPH concentrations were well below their respective Utah ISLs in all other soil samples collected. A table summarizing the reported TPH-DRO and TRPH concentrations is presented as Table 2. The TPH-DRO and TRPH analytical results are presented in Appendix B.

#### 4.3 Volatile Organic Compounds

Based on apparent soil staining during excavation activities, four base and four sidewall soil samples collected during excavation activities were analyzed for volatile organic compounds (VOCs). The soil analytical results were compared to screening levels. As determined in the March 2005 report completed by DERR, the benchmark data from the Superfund Chemical Data Matrix (SCDM) are the accepted benchmark screening values. The analytical results indicate that several VOC constituents were detected in several of the soil samples collected. However, all reported concentrations of the detected VOC constituents are well below the SCDM benchmark screening values. A table summarizing the reported VOC concentrations is presented as Table 3. The VOC analytical results are presented in Appendix C.

#### 4.4 Polychlorinated Biphenyls

Based on apparent soil staining during excavation activities, four base and four sidewall soil samples collected during excavation activities were analyzed for polychlorinated biphenyls (PCBs). The soil analytical results were compared to screening levels. As determined in the March 2005 report completed by DERR, the benchmark data from the Superfund Chemical Data Matrix (SCDM) are the accepted benchmark screening values. The analytical results indicate that Arochlor 1254 was detected in three of the soil samples collected above its method detection limit. However, all reported concentrations were below the SCDM, Reference Dose Screen Concentration of 1,600 ug/kg. A table summarizing the reported PCB concentrations is presented as Table 4. The PCB analytical results are presented in Appendix D.

#### 4.5 TPH Fractionation

As discussed in Section 4.2, analytical results indicated that the soil sample collected from the base of the concrete vault (#3 Base, 12') had a reported concentration of TPH-DRO at 800 mg/kg, in exceedance of the current Utah Initial Screening Level (ISL) of 500 mg/kg. Therefore, pursuant to DERR's request, in order to segregate the carbon ranges of the TPH components into aliphatics and aromatics, TPH fractionation was conducted on soil sample, #3 Base, 12'. Site-specific Industrial/Commercial Cleanup Levels established by DERR personnel for each individual TPH fraction were compared to the analytical results. The analytical results indicate that none of the reported TPH-fraction concentrations exceed the calculated site-specific Industrial/Commercial Cleanup levels. A table summarizing the reported TPH fractionation concentrations and site-specific Industrial/Commercial Cleanup levels is presented as Table 5. The TPH Fractionation analytical results are presented in Appendix E.

## 5. DERR CONFIRMATION SAMPLING ACTIVITIES

On November 28, 2006, DERR personnel conducted additional soil confirmation sampling activities at the site. Two soil samples (LM-CN-North and LM-CN-South) were collected of the surficial soils from below the asphalt with a GeoProbe using the direct-push method. The soil samples were collected in the appropriate containers with gloved hands and transported on ice by DERR personnel to a Utah-certified laboratory for lead and arsenic analysis using U. S. EPA Method 6010B. DERR soil sample locations are presented on Figure 1.

## 6. DERR SOIL CONFIRMATION SAMPLE ANALYTICAL RESULTS

The analytical results indicated that arsenic was not detected above 100 mg/kg in either sample collected. However, lead was detected in one of the soil samples collected (LM-CN-South 6") at a concentration of 1,300 mg/kg, in exceedance of its site-specific cleanup level of 800 mg/kg. A table summarizing the DERR confirmation sampling results for lead and arsenic in soil is presented in Table 6. The lead and arsenic analytical results are presented in Appendix F.

Based on the analytical results, Wasatch determined that additional soil removal activities in the area of soil sample LM-CN-South were warranted in order to achieve compliance with the RAP.

## 7. ADDITIONAL SOIL EXCAVATION ACTIVITIES

Pursuant to conversations with DERR personnel, an area of 5 feet by 5 feet was saw cut in the asphalt at the location of soil sample LM-CN-South. On March 8, 2007, Wasatch supervised the removal of approximately 2 cubic yards of soil from Lake Metals/Pioneer Refining site. The excavation was completed to a depth of approximately 2.5 feet below ground surface. Five composite soil samples were collected by Wasatch personnel from the excavation. One soil sample (#4 BS-1, 2.5') was collected in five aliquots from the bottom of the excavation, each aliquot representing 5 square feet of the excavation. The other four samples (#4 SW-W, #4 SW-S, #4 SW-E, and #4 SW-N) were collected in 5 aliquots each, each sample taken from one sidewall of the excavation. The soil samples were collected in the appropriate containers with gloved hands and transported on ice to a Utah-certified laboratory for lead analysis using U. S. EPA Method 6010B. Pursuant to conversations with DERR personnel, arsenic was not analyzed in these confirmation soil samples as none of concentrations of arsenic in any of the previous confirmation samples collected were above the generic screening criteria of 100 mg/kg.

Additionally, DERR personnel were present on site and collected one confirmation base sample (LM-S-bot) and one confirmation sidewall sample (LM-S-N-Wall) at this time. The soil samples were collected in the appropriate containers with gloved hands and transported on ice by DERR personnel to a Utah-certified laboratory for lead analysis using U. S. EPA Method 6010B. The excavated area and the Wasatch and DERR confirmatory soil sample locations are presented on Figure 1. It should be noted that these sample locations are representations and are not actual locations as numerous aliquots for sample collection were used from the base and sidewalls of this excavated area.

Once the excavation was deemed complete, clean road base from Staker Parsons Companies was spread and compacted in the excavated area and the area was re-surfaced with asphalt.

## 8. DERR AND WASATCH SOIL CONFIRMATION SAMPLE RESULTS

Upon removal of the additional surficial soils at the site, Wasatch personnel collected 1 base and 4 sidewall confirmation soil samples in the soil excavation area. DERR personnel collected 1 base and 1 sidewall confirmation soil sample in the soil excavation area. The analytical results indicated that none of the confirmation soil samples collected had reported concentrations of lead above the determined generic screening criteria. A table summarizing the reported lead concentrations collected from the soil

confirmation samples from both Wasatch and DERR personnel is presented in Table 6. The lead analytical results are presented in Appendix F.

## **9. CONCLUSIONS AND RECOMMENDATIONS**

Pursuant to activities discussed in Wasatch's April 10, 2006, "Remedial Action Plan", Wasatch supervised the removal of lead and arsenic impacted surficial soils at the Lake Metals/Pioneer Refining site. Analytical results from confirmation soil samples collected from both Wasatch and DERR personnel indicate that the remaining lead and arsenic concentrations in the soils at the site are below the generic screening criteria of 800 mg/kg and 100 mg/kg, respectively. Also, consistent with results from previous investigations conducted by DERR, low levels of petroleum hydrocarbons and PCBs are present in some remaining soils at the site; however, all detected concentrations are below appropriate actions levels. Therefore, based on the analytical results, it is Wasatch's opinion that the soil removal activities have satisfied the requirements of the April 2006 RAP and the Lake Metals/Pioneer Refining facility should receive a Certificate of Completion.



## REFERENCES

DERR (Utah Division of Environmental Response and Remediation), 2005, Innovative Site Assessment, Lake Metals Site, Salt lake City, Utah.

Wasatch Environmental, Inc., 2005, Quality Assurance Project Plan Lake Metals/Pioneer Refining Site Salt Lake City, Utah, Project No. 1076-41D.

Wasatch Environmental, Inc., 2006, Site Investigation Results Andrew Avenue Parcel Salt Lake City, Utah, Project No. 1076-41D.

Wasatch Environmental, Inc., 2006, Remedial Action Plan Lake Metals/Pioneer Refining Salt Lake City, Utah, Project No. 1076-41E.

Wasatch Environmental, Inc., 2005, Environmental Assessment Lake Metals/Pioneer Refining Site 1520 Pioneer Road Salt Lake City, Utah, Project No. 1076-41C.

## Tables

**Table 1**  
**Lake Metals**  
**Lead and Arsenic Soil Analytical Results**  
**(mg/kg)**

Sample I.D.	Date Collected	Depth Collected	Concentrations Lead mg/kg	Concentrations Arsenic mg/kg	Concentrations Q	Notes
BS-1	7/31/2006	6"	60	5.4	U	
BS-2	8/1/2006	6"	87	5.5	U	MS/MSD performed
BS-3	8/2/2006	6"	66	5.6	U	
BS-3 (Dup)	8/2/2006	6"	130	5.5	U	
BS-4	8/2/2006	6"	200	5.7	U	MS/MSD performed
BS-5	8/2/2006	6"	30	5.6	U	
BS-5 (Dup)	8/2/2006	6"	53	7.2	U	
BS-6	8/2/2006	6"	110	5.9	U	
BS-7	8/3/2006	6"	250	5.8	U	
BS-8	8/3/2006	6"	37	5.7	U	
BS-9	8/3/2006	6"	68	5.4	U	
BS-10	8/9/2006	1.5'	47	5.7	U	
BS-11	8/9/2006	1.5'	560	5.7	U	
Exc#1, BS-2'	7/31/2006	2.0'	18	5.9	U	
Exc#1, SW-W	7/31/2006	1.0'	15	5.9	U	
Exc#1, SW-S	7/31/2006	1.0'	15	5.9	U	
Exc#1, SW-E	7/31/2006	1.0'	23	5.8	U	
Exc#1, SW-N	7/31/2006	1.0'	19	5.6	U	
Exc#2, BS-2'	8/3/2006	1.0'	12	5.9	U	
Exc#2, SW-E	8/3/2006	1.0'	37	6.2	U	
Exc#2, SW-N	8/3/2006	1.0'	27	6.2	U	
Exc#2, SW-W	8/3/2006	1.0'	90	6	U	
Exc#2, SW-S	8/3/2006	1.0'	46	5.9	U	
Generic Screening Criteria			800	100	--	--

Q = Data Qualifier

U = The analyte was not detected above the laboratory quantitation limit

J = The numerical value is estimated because the Quality Control criteria were not met

Table 2  
Lake Metals  
TPH-DRO and TRPH  
Concentrations in Soil  
(mg/kg)

Sample I.D.	Date Collected	Depth Collected	Concentrations		Concentrations		Notes
			TPH-DRO mg/kg	Q	TRPH mg/kg	Q	
Exc#2, BS-2'	8/3/2006	1.0'	24	U	180	U	
Exc#2, SW-E	8/3/2006	1.0'	210		190		
Exc#2, SW-N	8/3/2006	1.0'	24	U	180	U	
Exc#2, SW-W	8/3/2006	1.0'	24	U	180	U	
Exc#2, SW-S	8/3/2006	1.0'	24	U	180	U	
#3 Base	8/7/2006	12'	800		840		
BS-10	8/9/2006	1.5'	23	U	170	U	
BS-11	8/9/2006	1.5'	23	U	170	U	
Utah ISL	--	--	500	--	1,000	--	
Tier 1 SL	--	--	5,000	--	10,000	--	

**Bold concentrations exceed Utah Initial Screening Level (ISL)**

Q = Data Qualifier

U = The analyte was not detected above the laboratory quantitation limit

J = The numerical value is estimated because the Quality Control criteria were not met

Table 3  
Lake Metals  
Organic Concentrations In Soil  
(ug/kg)

Analyte	Soil Pathway		Approx. Depth (feet)		1.0		1.0		1.0	
	Benchmark Values	Benchmark Values	Sample Location	Sample Type	Exc#2, SW-E	Exc#2, SW-N	Exc#2, SW-W	Exc#2, SW-S	Exc#2, SW-S	Exc#2, SW-S
	SCDM (1)	SCDM (2)			Field Sample	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Carbon Disulfide	7,800,000	---			ug/kg	Q	ug/kg	Q	ug/kg	Q
1,3-Dichlorobenzene	---	---			2.6	U	2.4	U	2.4	U
1,4-Dichlorobenzene	---	27,000			18	U	2.4	U	2.4	U
1,2-Dichlorobenzene	---	---			21	U	2.4	U	2.4	U
1,2,4-Trichlorobenzene	780,000	---			5.1	U	2.4	U	2.4	U
					78	5.1	4.4	24		

SCDM (1) = Superfund Chemical Data Matrix, 1/2004, Reference Dose Screen Concentration  
 SCDM (2) = Superfund Chemical Data Matrix, 1/2004, Cancer Risk Screen Concentration  
 ug/kg = microgram per kilogram  
 Q = Data Qualifier  
 U = The analyte was not detected above the laboratory quantitation limit  
 J = The numerical value is estimated because the Quality Control criteria were not met

Analyte	Soil Pathway		Approx. Depth (feet)		2.0		12.0		1.5	
	Benchmark Values	Benchmark Values	Sample Location	Sample Type	Exc#2, BS-2'	#3 Base	BS-10	BS-11	BS-10	BS-11
	SCDM (1)	SCDM (2)			Field Sample	Field Sample	Field Sample	Field Sample	Field Sample	Field Sample
Carbon Disulfide	7,800,000	---			ug/kg	Q	ug/kg	Q	ug/kg	Q
1,3-Dichlorobenzene	---	---			2.4	U	2.7	U	2.3	U
1,4-Dichlorobenzene	---	27,000			2.4	U	2.7	U	2.3	U
1,2-Dichlorobenzene	---	---			2.4	U	2.7	U	2.3	U
1,2,4-Trichlorobenzene	780,000	---			2.4	U	2.7	U	2.3	U
					49	2.7	2.3	2.3	2.3	2.3

SCDM (1) = Superfund Chemical Data Matrix, 1/2004, Reference Dose Screen Concentration  
 SCDM (2) = Superfund Chemical Data Matrix, 1/2004, Cancer Risk Screen Concentration  
 ug/kg = microgram per kilogram  
 Q = Data Qualifier  
 U = The analyte was not detected above the laboratory quantitation limit  
 J = The numerical value is estimated because the Quality Control criteria were not met

Table 4  
Lake Metals  
PCB Concentrations in Soil  
(ug/kg)

Analyte	Soil Pathway		Approx. Depth (feet)	1.0		1.0		1.0		1.0	
	Benchmark Values	Benchmark Values		Exc#2, SW-E		Exc#2, SW-N		Exc#2, SW-W		Exc#2, SW-S	
	SCDM (1)	SCDM (2)		Field Sample	Q	Field Sample	Q	Field Sample	Q	Field Sample	Q
Aroclor 1016	ug/kg	ug/kg									
Aroclor 1221	1,600	320		30	U	30	U	30	U	30	U
Aroclor 1232	1,600	320		30	U	30	U	30	U	30	U
Aroclor 1242	1,600	320		30	U	30	U	30	U	30	U
Aroclor 1248	1,600	320		30	U	30	U	30	U	30	U
Aroclor 1254	1,600	320		400	J	46	J	30	UJ	1,200	J
Aroclor 1260	1,600	320		30	U	30	U	30	U	30	U

SCDM (1) = Superfund Chemical Data Matrix, 1/2004, Reference Dose Screen Concentration

SCDM (2) = Superfund Chemical Data Matrix, 1/2004, Cancer Risk Screen Concentration

ug/kg = microgram per kilogram

Q = Data Qualifier

U = The analyte was not detected above the laboratory quantitation limit

J = The numerical value is estimated because the Quality Control criteria were not met  
Concentrations in Bold exceed SCDM Cancer Risk

Analyte	Soil Pathway		Approx. Depth (feet)	2.0		12.0		1.5		1.5	
	Benchmark Values	Benchmark Values		Exc#2, BS-2'		#3 Base		BS-10		BS-11	
	SCDM (1)	SCDM (2)		Field Sample	Q	Field Sample	Q	Field Sample	Q	Field Sample	Q
Aroclor 1016	ug/kg	ug/kg									
Aroclor 1221	1,600	320		30	U	34	U	29	U	29	U
Aroclor 1232	1,600	320		30	U	34	U	29	U	29	U
Aroclor 1242	1,600	320		30	U	34	U	29	U	29	U
Aroclor 1248	1,600	320		30	U	34	U	29	U	29	U
Aroclor 1254	1,600	320		30	U	34	U	29	U	29	U
Aroclor 1260	1,600	320		30	U	34	U	29	U	29	U

SCDM (1) = Superfund Chemical Data Matrix, 1/2004, Reference Dose Screen Concentration

SCDM (2) = Superfund Chemical Data Matrix, 1/2004, Cancer Risk Screen Concentration

ug/kg = microgram per kilogram

Q = Data Qualifier

U = The analyte was not detected above the laboratory quantitation limit

J = The numerical value is estimated because the Quality Control criteria were not met  
Concentrations in Bold exceed SCDM Cancer Risk

**Table 5**  
**Lake Metals**  
**TPH Fractionation Analyses in Soil**  
**(mg/kg)**

	Site Specific	Date	Sample I.D.	
	Industrial/Commercial	Collected	#3 Base 12'	
	Cleanup Level			
Analyte	(mg/kg)		mg/kg	Q
Benzene	52*	8/7/2006	0.0037	
Toluene	204,000*	8/7/2006	0.021	
Ethylbenzene	102,000*	8/7/2006	0.0068	U
Total Xylenes	204,000*		0.013	
Naphthalene	20,400*	8/7/2006	0.014	U
MTBE	5,110*	8/7/2006	0.0068	U
C9-C10 (aromatics)	40,900*	8/7/2006	1.0	
C11-C13 (aromatics)	4,090*	8/7/2006	0.850	
C12-C22 (aromatics)	30,700*	8/7/2006	0.270	U
Acenaphthalene	30,700*	8/7/2006	0.270	U
Acenaphthene	61,300*	8/7/2006	0.270	U
Fluorene	40,900*	8/7/2006	0.270	U
Phenanthracene	30,700*	8/7/2006	0.270	U
Anthracene	307,000*	8/7/2006	0.270	U
Fluoranthene	40,900*	8/7/2006	0.270	U
Pyrene	30,700*	8/7/2006	0.270	U
Benz(a) Anthracene	3.92*	8/7/2006	0.340	U
Chrysene	392*	8/7/2006	0.270	U
Benzo (b) Fluoranthene	3.92*	8/7/2006	0.340	U
Benzo (k) Fluoranthene	39.2*	8/7/2006	0.340	U
Benzo (a) Pyrene	0.392*	8/7/2006	0.340	U
Indeno (1,2,3-cd) Pyrene	3.92*	8/7/2006	0.340	U
Dibenzo (a,h) Anthracene	0.392*	8/7/2006	0.340	U
Benzo (g,h,i) Perylene	30,700*	8/7/2006	0.340	U
C4-C8 (aliphatics)	61,300*	8/7/2006	0.068	U
C9-C16 (aliphatics)	102,000*	8/7/2006	6.425	
C17-C35 (aliphatics)	>solubility*	8/7/2006	154.0	

\* = Site Specific Cleanup Level calculated by Utah DERR personnel

Q = Data Qualifier

U = The analyte was not detected above the laboratory quantitation limit

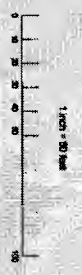
J = The numerical value is estimated because the Quality Control criteria were not met

Table 6  
Lake Metals  
Confirmation Sampling  
Conducted by Utah DERR and Wasatch  
Lead and Arsenic Soil Results  
(mg/kg)

Sample I.D.	Date Collected	Depth Collected	Collected By	Concentrations	
				Lead mg/kg	Arsenic mg/kg
LM-CN-North	11/28/2006	6"	Utah DERR	270	12
LM-CN-South	11/28/2006	6"	Utah DERR	1,300	33
LM-S-Bot	3/8/2007	2.5'	Utah DERR	44	NA
LM-S-N-Wall	3/8/2007	various	Utah DERR	57	NA
Exc #4 BS-1	3/8/2007	2.5'	Wasatch	51	NA
Exc #4 SW-N	3/8/2007	various	Wasatch	38	NA
Exc #4 SW-S	3/8/2007	various	Wasatch	59	NA
Exc #4 SW-E	3/8/2007	various	Wasatch	80	NA
Exc #4 SW-W	3/8/2007	various	Wasatch	52	NA
Generic Screening Criteria				800	100

**Bold concentrations exceed Generic Screening Criteria**





West Andrew Avenue

Storage Building  
(UOP Building 25)

BS-5 6"

Water Building  
(UOP Building 27)

Chem Plant Building  
(UOP Building 26)

#4 SW-S

#4 SW-W

#4 SW-N

#4 SW-E

Proposed excavation  
5x5x1.5 deep

LM-CN South 6"

Excavation #1 (2' deep)

LM-CN North 6"

Warehouse

\* BS-1 6"

#2 BS-E

Excavation #2 (2' deep)

Excavation #3 (12' deep)

S-10 1.5"

Warehouse

BS-7 6"

\* BS-4 6"

South Pioneer Road

2411N West California Avenue  
Salt Lake City, UT 84114  
801-572-5441  
www.wasatch-environmental.com



Excavation Area and Confirmation Sample Locations  
Lake Metals/Pioneer Refining Site  
Salt Lake City, Utah

PROJECT NO. 107417  
DATE  
Figure 1

- \* WASATCH Confirmation Soil Sample
- \* DERR Confirmation Soil Sample
- Excavation to 2.5'
- Mass Digged Area (approximate)
- Area Excavated (~2')
- Area Excavated (~12')
- Revised -15'
- Revised -5'
- 1x1 ft
- 5x5 ft
- 10x10 ft

**Appendix A**

**Lead and Arsenic Analytical Results**



AMERICAN  
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ANALYTICAL  
LABORATORIES

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

November 10, 2006

Rebecca Studenka  
Wasatch Environmental  
2410 West California Avenue  
Salt Lake City, UT 84104

TEL: (801) 972-8400

FAX: (801) 972-8459

RE: Lake Metals / 1076-41F

Dear Rebecca Studenka:

Lab Set ID: L73132

American West Analytical Labs received 6 samples on 7/31/2006 for the analyses presented in the following report.

All analyses were performed in accordance to National Environmental Laboratory Accreditation Program (NELAP) protocols unless noted otherwise. If you have any questions or concerns regarding this report please feel free to call.

*Second revision. Pages 1 and 23, 24, 28 and 37 have been revised. MS/MDS revisions made.*

Thank you.

Approved by: 

Laboratory Director or designee

Report Date: 11/10/2006 Page 1 of 37

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance to NELAP protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73132-01B  
Field Sample ID: #1 BS-2'  
Collected: 7/31/2006 9:15:00 AM  
Received: 7/31/2006

463 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	7/31/2006 10:57:33 PM	6010B	5.9	< 5.9
Lead	mg/kg-dry	7/31/2006 10:57:33 PM	6010B	5.9	18

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Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 11/10/2006 Page 2 of 37

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance to NELAP protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73132-02B  
Field Sample ID: #1 SW-W  
Collected: 7/31/2006 9:30:00 AM  
Received: 7/31/2006

463 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	7/31/2006 11:01:07 PM	6010B	5.9	< 5.9
Lead	mg/kg-dry	7/31/2006 11:01:07 PM	6010B	5.9	15

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 11/10/2006 Page 3 of 37



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73132-03B  
Field Sample ID: #1 SW-S  
Collected: 7/31/2006 9:40:00 AM  
Received: 7/31/2006

463 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	7/31/2006 11:04:42 PM	6010B	5.9	< 5.9
Lead	mg/kg-dry	7/31/2006 11:04:42 PM	6010B	5.9	15

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QA Officer

Report Date: 11/10/2006 Page 4 of 37

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance with NELAP protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inorganic analytical analysis in regard to the data and information on the face of the report and of all data.



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Laboratory Director

Peggy McNicol  
QA Officer

## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

Lab Sample ID: L73132-04B  
Field Sample ID: #1 SW-E  
Collected: 7/31/2006 9:45:00 AM  
Received: 7/31/2006

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	7/31/2006 11:08:17 PM	6010B	5.8	< 5.8
Lead	mg/kg-dry	7/31/2006 11:08:17 PM	6010B	5.8	23

Report Date: 11/10/2006 Page 5 of 37

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## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73132-05B  
Field Sample ID: #1 SW-N  
Collected: 7/31/2006 9:50:00 AM  
Received: 7/31/2006

463 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	7/31/2006 11:23:46 PM	6010B	5.6	< 5.6
Lead	mg/kg-dry	7/31/2006 11:23:46 PM	6010B	5.6	19

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Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 11/10/2006 Page 6 of 37

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance to NELAP protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of law.



## CHAIN OF CUSTODY FORM

overnight

LAB#: 73132

[illegible]

62

Samples Were:		COC Tape Was:		Container Type:		No. Rec.
<input type="checkbox"/> Shipped By:		Present on Outer Package		<input type="checkbox"/> AWAL Supplied Plastic		
<input checked="" type="checkbox"/> Hand Delivered		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		<input type="checkbox"/> AWAL Supplied Clear Glass		
<input type="checkbox"/> Ambient		Unbroken on Outer Package		<input type="checkbox"/> AWAL Supplied Amber Glass		
<input checked="" type="checkbox"/> Chilled		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		<input type="checkbox"/> AWAL Supplied VOA/TOC/TOX Vials		
Temperature	10 °C	Present on Sample		<input type="checkbox"/> Amber <input type="checkbox"/> Clear <input type="checkbox"/> Headspace <input type="checkbox"/> No Headspace		
Rec. Broken/Leaking	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		<input type="checkbox"/> Non AWAL Supplied Container		
Notes:		Unbroken on Sample		Notes:		
		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A				
Properly Preserved	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Notes:				
Notes:						
Rec. Within Hold	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			Discrepancies Between Labels and COC		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Rec. Out of Hold	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Notes:		
Notes:						

Bottle Type	Preservative	All pHs OK
Ammonia	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
COD	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
Cyanide	pH > 12 NaOH	
Metals	pH < 7 HNO <sub>3</sub>	
NO <sub>2</sub> & NO <sub>3</sub>	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
Nutrients	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
O & G	pH < 7 HCL	
Phenols	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
Sulfide	pH > 9 NaOH, ZnAC	
TKN	pH < 7 H <sub>2</sub> SO <sub>4</sub>	
TOC	pH < 7 H <sub>3</sub> PO <sub>4</sub>	
T PO <sub>4</sub>	pH < 7 H <sub>2</sub> SO <sub>4</sub>	

**Procedure:**

- 1) Pour a small amount of sample in the sample lid
- 2) Pour sample from Lid gently over wide range pH paper
- 3) Do Not dip the pH paper in the sample bottle or lid
- 4) If sample is not preserved properly flat its extension and
- 5) Flag COC and notify client for further instructions
- 6) Place client conversation on COC
- 7) Samples may be adjusted at client request

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Dept: MB

Work Order: L73132

Sample Type: LCS

Project: Lake Metals / 1076-41F

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%RBC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
LCS-29823	Arsenic	mg/kg	6010B	19.49	20	0	97.4	75-125				7/31/2006
LCS-29823	Lead	mg/kg	6010B	19.35	20	0	96.7	75-125				7/31/2006
LCS-29826	Arsenic	mg/L	6010B	0.4153	0.4	0	104	75-125				8/1/2006
LCS-29826	Lead	mg/L	6010B	0.4070	0.4	0	102	75-125				8/1/2006

Report Date: 11/10/2006 Page 21 of 37

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Dept: ME

Work Order: L73132

Sample Type: MBLK

Project: Lake Metals / 1076-41F

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%RBC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
MB-29823	Arsenic	mg/kg	6010B	< 5.0								7/31/2006
MB-29823	Lead	mg/kg	6010B	< 5.0								7/31/2006
MB-29826	Arsenic	mg/L	6010B	< 0.10								8/1/2006
MB-29826	Lead	mg/L	6010B	< 0.10								8/1/2006
MB-TCLP-29820	Arsenic	mg/L	6010B	< 0.10								8/1/2006
MB-TCLP-29820	Lead	mg/L	6010B	< 0.10								8/1/2006
MB-TCLP-29820	Arsenic	mg/L	6010B	< 0.10								8/1/2006
MB-TCLP-29820	Lead	mg/L	6010B	< 0.10								8/1/2006

Report Date: 11/10/2006 Page 22 of 37

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental  
Work Order: L73132  
Project: Lake Metals / 1076-41F

Dept: ME

SampType: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73132-05BMS	Arsenic	mg/kg-dry	6010B	23.57	22.58	1.637	97.1	75-125			^	7/31/2006
L73132-05BMS	Lead	mg/kg-dry	6010B	39.29	22.58	19.26	88.7	75-125			^	7/31/2006
L73085-02AMS	Arsenic	mg/L	6010B	0.4787	0.4	0	120	75-125				8/1/2006
L73085-02AMS	Lead	mg/L	6010B	0.3976	0.4	0	99.4	75-125				8/1/2006

^ Reissue of a previously generated report. Information has been revised, an incorrect duplicate entry for As and Pb have been removed. Information herein supersedes that of previously issued reports.

! Spike recovery indicates matrix interference. The method is in control as indicated by the laboratory control sample (LCS).

# AMERICAN WEST ANALYTICAL LABORATORIES

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Kyle F. Gross

Laboratory Director

Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73132

Project: Lake Metals / 1076-41P

Dept: MB

SampType: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73132-05BMSD	Arsenic	mg/kg-dry	6010B	24.31	22.06	1.637	103	75-125	3.08	20	^	7/31/2006
L73132-05BMSD	Lead	mg/kg-dry	6010B	37.71	22.06	19.26	83.6	75-125	4.13	20	^	7/31/2006
L73085-02AMSD	Arsenic	mg/L	6010B	0.4583	0.4	0	115	75-125	4.36	20		8/1/2006
L73085-02AMSD	Lead	mg/L	6010B	0.3909	0.4	0	97.7	75-125	1.71	20		8/1/2006

^ Reissue of a previously generated report. Information has been revised, an incorrect duplicate entry for As and Pb have been removed. Information herein supersedes that of previously issued reports.

! Spike recovery indicates matrix interference. The method is in control as indicated by the laboratory control sample (LCS).

Report Date: 11/10/2006 Page 24 of 37



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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

November 10, 2006

Rebecca Studenka  
Wasatch Environmental  
2410 West California Avenue  
Salt Lake City, UT 84104

TEL: (801) 972-8400

FAX: (801) 972-8459

RE: Lake Metals / 1076-41F

Lab Set ID: L73140

Dear Rebecca Studenka:

American West Analytical Labs received 1 sample on 7/31/2006 for the analyses presented in the following report.

All analyses were performed in accordance to National Environmental Laboratory Accreditation Program (NELAP) protocols unless noted otherwise. If you have any questions or concerns regarding this report please feel free to call.

*Second revision. Pages 1 and 5-6 have been revised. Error was corrected on MS/MSD pages.*

Thank you.

Approved by: 

Laboratory Director or designee

Report Date: 11/10/2006 Page 1 of 6

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance to NELAC protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73140-01A  
Field Sample ID: BS-1 6"  
Collected: 7/31/2006 3:15:00 PM  
Received: 7/31/2006

463 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	8/1/2006 11:24:40 AM	6010B	5.4	< 5.4
Lead	mg/kg-dry	8/1/2006 11:24:40 AM	6010B	5.4	60

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 11/10/2006 Page 2 of 6

All analysis applicable to the CWA, SDWA and RCRA are performed in accordance to NELAP protocols. Pertinent sampling information is located on the attached Chain-of-Custody. This report is provided for the exclusive use of the addressee. Privileges of subsequent use of the name of this company or any member of its staff, or reproduction of this report in connection with the advertisement, promotion or sale of any product or process, or in connection with the re-publication of this report for any purpose other than for the addressee will be granted only on contact. This company accepts no responsibility except for the due performance of inspection and/or analysis in good faith and according to the rules of the trade and of science.





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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental  
Work Order: L73140  
Project: Lake Metals / 1076-41F

Dept: MB

Samp/Type: LCS

Sample ID	Analyte	Units	Method	Result	Amount		%RBC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
					Spiked	Original						
LCS-29823	Arsenic	mg/kg	6010B	19.49	20	0	97.4	75-125				7/31/2006
LCS-29823	Lead	mg/kg	6010B	19.35	20	0	96.7	75-125				7/31/2006

Report Date: 11/10/2006 Page 3 of 6



# AMERICAN WEST ANALYTICAL LABORATORIES

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73140

Project: Lake Metals / 1076-41F

Dept: MB

Sample Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
MB-29823	Arsenic	mg/kg	6010B	< 5.0				-				7/31/2006
MB-29823	Lead	mg/kg	6010B	< 5.0				-				7/31/2006



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Kyle P. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

QC SUMMARY REPORT

CLIENT: Wasatch Environmental  
Work Order: L73140  
Project: Lake Metals / 1076-41F

Dept: ME

SampleType: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73132-05BMS	Arsenic	mg/kg-dry	6010B	23.57	22.58	1.637	97.1	75-125			^	7/31/2006
L73132-05BMS	Lead	mg/kg-dry	6010B	39.29	22.58	19.26	88.7	75-125			^	7/31/2006

^ Reissue of a previously generated report. Information has been revised, an incorrect duplicate entry for As and Pb have been removed. Information herein supersedes that of previously issued reports.

Report Date: 11/10/2006 Page 5 of 6



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Kyle F. Gross

Laboratory Director

Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental  
Work Order: L73140  
Project: Lake Metals / 1076-41F

Dept: ME

SampType: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73132-05BMSD	Arsenic	mg/kg-dry	6010B	24.31	22.06	1.637	103	75-125	3.08	20	^	7/31/2006
L73132-05BMSD	Lead	mg/kg-dry	6010B	37.71	22.06	19.26	83.6	75-125	4.13	20	^	7/31/2006

^ Reissue of a previously generated report. Information has been revised, an incorrect duplicate entry for As and Pb have been removed. Information herein supersedes that of previously issued reports.

Report Date: 11/10/2006 Page 6 of 6

LAB#: 73140

Page of



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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

August 02, 2006

Rebecca Studenka  
Wasatch Environmental  
2410 West California Avenue  
Salt Lake City, UT 84104

TEL: (801) 972-8400

FAX: (801) 972-8459

RE: Lake Metals / 1076-41F

Lab Set ID: L73167

Dear Rebecca Studenka:

American West Analytical Labs received 1 sample on 8/1/2006 for the analyses presented in the following report.

All analyses were performed in accordance to National Environmental Laboratory Accreditation Program (NELAP) protocols unless noted otherwise. If you have any questions or concerns regarding this report please feel free to call.

Thank you.

Approved by:

  
Laboratory Director or designee

Report Date: 8/2/2006 Page 1 of 6



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73167-01A

Field Sample ID: BS-2 6"

Collected: 8/1/2006 2:30:00 PM

Received: 8/1/2006

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	8/1/2006 6:09:22 PM	6010B	5.5	< 5.5
Lead	mg/kg-dry	8/1/2006 6:09:22 PM	6010B	5.5	87 <sup>1</sup>

<sup>1</sup> Spike recovery indicates matrix interference. The method is in control as indicated by the laboratory control sample (LCS).

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Peggy McNicol  
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Kyle F. Gross

Laboratory Director

Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73167

Project: Lake Metals / 1076-41F

Dept: ME

SampleType: LCS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
LCS-29846	Arsenic	mg/kg	6010B	21.27	20	0	106	75-125				8/1/2006
LCS-29846	Lead	mg/kg	6010B	21.17	20	0	106	75-125				8/1/2006



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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental  
Work Order: L73167  
Project: Lake Metals / 1076-41F

Dept: ME

Sample Type: MBLK

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
MB-29846	Arsenic	mg/kg	6010B	< 5.0								8/1/2006
MB-29846	Lead	mg/kg	6010B	< 5.0								8/1/2006

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Kyle F. Gross

Laboratory Director

Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73167

Project: Lake Metals / 1076-41F

Dept: ME

Sample Type: MSD

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73167-01AMSD	Arsenic	mg/kg-dry	6010B	22.01	21.38	0.9159	98.7	75-125	3.12	20		8/1/2006
L73167-01AMSD	Lead	mg/kg-dry	6010B	70.24	21.38	86.69	-77.0	75-125	1.43	20		8/1/2006

\* Spike recovery indicates matrix interference. The method is in control as indicated by the laboratory control sample (LCS).

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Kyle F. Gross

Laboratory Director

Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73167

Project: Lake Metals / 1076-41F

Dept: ME

SampleType: MS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
L73167-01AMS	Arsenic	mg/kg-dry	6010B	21.33	21.82	0.9159	93.6	75-125				8/1/2006
L73167-01AMS	Lead	mg/kg-dry	6010B	71.25	21.82	86.69	-70.8	75-125				8/1/2006

1 Spike recovery indicates matrix interference. The method is in control as indicated by the laboratory control sample (LCS).

# American West Analytical Labs

Given to client  
8/12/06

## WORK ORDER SUMMARY

01-Aug-06

Work Order L73167

Client ID: WAS580

QC Level: QC 2+

Project: Lake Metals / 1076-41F

Location:

Comments: Next Day Rush; QCLevel: QC 2+

# RUSH

Sample ID	Client Sample ID	Collection Date	Date Received	Date Due	Matrix	Test Code	Storage
L73167-01A	BS-2 6"	8/1/2006 2:30:00 PM	8/1/2006	8/2/2006	Soil	3051A-ICPMS	aug 1 metals
				8/2/2006		ICP-S	aug 1 metals
				8/2/2006		PMOIST	aug 1 metals

**LABORATORY USE ONLY**

SAMPLES UPON:

1 Ship to: and returned  
Notes:

2 Ambient & Chilled  
Notes:

3 Temperature 18°

4 Received in: Leaking  
(Improperly Sealed)  
Y Notes: (N)

5 Property Preserved  
Y Notes: (M)

6 Received Within  
Holding Time  
Y Notes: (M)

[illegible]



63 West 3600 South  
Salt Lake City, Utah  
84115

TEL: (801) 972-8400

**FAX: (801) 972-8459**

RE: Lake Metals / 1076-41F

Lab Set ID: L73179

**Dear Rebecca Studenka:**

American West Analytical Labs received 3 samples on 8/2/2006 for the analyses presented in the following report.

All analyses were performed in accordance to National Environmental Laboratory Accreditation Program (NELAP) protocols unless noted otherwise. If you have any questions or concerns regarding this report please feel free to call.

Thank you.

**Kyle F. Gross**  
**Laboratory Director**

**Peggy McNicol**  
**QA Officer**

Approved by:

Laboratory Director or designee

Report Date: 8/3/2006 Page 1 of 8



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73179-01A  
Field Sample ID: BS-3 @ 6"  
Collected: 8/2/2006 9:20:00 AM  
Received: 8/2/2006

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	8/2/2006 8:39:41 PM	6010B	5.6	< 5.6
Lead	mg/kg-dry	8/2/2006 8:39:41 PM	6010B	5.6	66

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 8/3/2006 Page 2 of 8



## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73179-02A  
Field Sample ID: BS-3 @ 6" Dup  
Collected: 8/2/2006 9:20:00 AM  
Received: 8/2/2006

63 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	8/2/2006 8:43:44 PM	6010B	5.5	< 5.5
Lead	mg/kg-dry	8/2/2006 8:43:44 PM	6010B	5.5	130

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Kyle F. Gross  
Laboratory Director

Peggy McNicol  
QA Officer

Report Date: 8/3/2006 Page 3 of 8





## INORGANIC ANALYSIS REPORT

Client: Wasatch Environmental  
Project ID: Lake Metals / 1076-41F

Contact: Rebecca Studenka

AMERICAN  
WEST  
ANALYTICAL  
LABORATORIES

Lab Sample ID: L73179-03A  
Field Sample ID: BS-4 @ 6" (MS/MSD)  
Collected: 8/2/2006 9:35:00 AM  
Received: 8/2/2006

53 West 3600 South  
Salt Lake City, Utah  
84115

### TOTAL METALS

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Results
Arsenic	mg/kg-dry	8/2/2006 8:51:43 PM	6010B	5.7	< 5.7
Lead	mg/kg-dry	8/2/2006 8:51:43 PM	6010B	5.7,	200 <sup>2</sup>

<sup>2</sup> Analyte concentration is too high for accurate spike recovery.

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Report Date: 8/3/2006 Page 4 of 8

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Kyle F. Gross

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Peggy McNicol

QA Officer

## QC SUMMARY REPORT

CLIENT: Wasatch Environmental

Work Order: L73179

Project: Lake Metals / 1076-41F

Dept: ME

SampType: LCS

Sample ID	Analyte	Units	Method	Result	Amount Spiked	Original Amount	%REC	Limits	%RPD	RPD Limit	Qualifiers	Analysis Date
LCS-29867	Arsenic	mg/kg	6010B	20.22	20	0	101	75-125				8/2/2006
LCS-29867	Lead	mg/kg	6010B	20.19	20	0	101	75-125				8/2/2006